

Release notes for ENDF/B Development n-063_Eu_155
evaluation

ENDF
B-VII.dev

April 26, 2017

- checkr Warnings:

1. A previous error halted parsing of the current section
MAT=6337, MF= 1, MT=451 (1): Parsing stopped

```
ERROR(S) FOUND IN MAT=6337, MF= 1, MT=451
SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER      81 TO      125
```

- checkr Errors:

1. A variable is outside the allowed ENDF range
MAT=6337, MF= 1, MT=451 (0): Variable range

```
ERROR(S) FOUND IN MAT=6337, MF= 1, MT=451
MOD =      1 OUT OF RANGE      0 -      0      RECORD NUMBER      81
```

2. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 2, MT=151 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=6337, MF= 2, MT=151
SECTION 2/151 NOT IN DIRECTORY      RECORD NUMBER      127
```

3. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 1 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 1
SECTION 3/ 1 NOT IN DIRECTORY      RECORD NUMBER      495
```

4. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 2 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 2
SECTION 3/ 2 NOT IN DIRECTORY      RECORD NUMBER      517
```

5. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 4 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 4
SECTION 3/ 4 NOT IN DIRECTORY      RECORD NUMBER      539
```

6. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 16 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 16
SECTION 3/ 16 NOT IN DIRECTORY      RECORD NUMBER      560
```

7. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 17 (0): Directory (b)

ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 17
SECTION 3/ 17 NOT IN DIRECTORY RECORD NUMBER 569

8. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 22 (0): Directory (b)

ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 22
SECTION 3/ 22 NOT IN DIRECTORY RECORD NUMBER 575

9. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 28 (0): Directory (b)

ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 28
SECTION 3/ 28 NOT IN DIRECTORY RECORD NUMBER 582

10. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 51 (0): Directory (b)

ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 51
SECTION 3/ 51 NOT IN DIRECTORY RECORD NUMBER 590

11. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 52 (0): Directory (b)

ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 52
SECTION 3/ 52 NOT IN DIRECTORY RECORD NUMBER 611

12. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 53 (0): Directory (b)

ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 53
SECTION 3/ 53 NOT IN DIRECTORY RECORD NUMBER 632

13. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 54 (0): Directory (b)

ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 54
SECTION 3/ 54 NOT IN DIRECTORY RECORD NUMBER 652

14. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 55 (0): Directory (b)

ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 55
SECTION 3/ 55 NOT IN DIRECTORY RECORD NUMBER 672

15. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 56 (0): Directory (b)

- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 56 | RECORD NUMBER | 691 |
| SECTION 3/ 56 NOT IN DIRECTORY | | |
16. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 57 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 57 | RECORD NUMBER | 710 |
| SECTION 3/ 57 NOT IN DIRECTORY | | |
17. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT= 91 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=6337, MF= 3, MT= 91 | RECORD NUMBER | 728 |
| SECTION 3/ 91 NOT IN DIRECTORY | | |
18. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT=102 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=6337, MF= 3, MT=102 | RECORD NUMBER | 746 |
| SECTION 3/102 NOT IN DIRECTORY | | |
19. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT=103 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=6337, MF= 3, MT=103 | RECORD NUMBER | 768 |
| SECTION 3/103 NOT IN DIRECTORY | | |
20. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT=104 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=6337, MF= 3, MT=104 | RECORD NUMBER | 779 |
| SECTION 3/104 NOT IN DIRECTORY | | |
21. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT=105 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=6337, MF= 3, MT=105 | RECORD NUMBER | 788 |
| SECTION 3/105 NOT IN DIRECTORY | | |
22. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 3, MT=107 (0): Directory (b)
- | | | |
|---|---------------|-----|
| ERROR(S) FOUND IN MAT=6337, MF= 3, MT=107 | RECORD NUMBER | 796 |
| SECTION 3/107 NOT IN DIRECTORY | | |
23. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 4, MT= 2 (0): Directory (b)

- | | |
|--|-------------------|
| ERROR(S) FOUND IN MAT=6337, MF= 4, MT= 2 | |
| SECTION 4/ 2 NOT IN DIRECTORY | RECORD NUMBER 806 |
24. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 4, MT= 16 (0): Directory (b)
- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=6337, MF= 4, MT= 16 | |
| SECTION 4/ 16 NOT IN DIRECTORY | RECORD NUMBER 1035 |
25. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 4, MT= 17 (0): Directory (b)
- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=6337, MF= 4, MT= 17 | |
| SECTION 4/ 17 NOT IN DIRECTORY | RECORD NUMBER 1062 |
26. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 4, MT= 22 (0): Directory (b)
- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=6337, MF= 4, MT= 22 | |
| SECTION 4/ 22 NOT IN DIRECTORY | RECORD NUMBER 1077 |
27. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 4, MT= 28 (0): Directory (b)
- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=6337, MF= 4, MT= 28 | |
| SECTION 4/ 28 NOT IN DIRECTORY | RECORD NUMBER 1098 |
28. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 4, MT= 51 (0): Directory (b)
- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=6337, MF= 4, MT= 51 | |
| SECTION 4/ 51 NOT IN DIRECTORY | RECORD NUMBER 1121 |
29. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 4, MT= 52 (0): Directory (b)
- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=6337, MF= 4, MT= 52 | |
| SECTION 4/ 52 NOT IN DIRECTORY | RECORD NUMBER 1264 |
30. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 4, MT= 53 (0): Directory (b)
- | | |
|---|--------------------|
| ERROR(S) FOUND IN MAT=6337, MF= 4, MT= 53 | |
| SECTION 4/ 53 NOT IN DIRECTORY | RECORD NUMBER 1405 |
31. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 4, MT= 54 (0): Directory (b)

- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=6337, MF= 4, MT= 54 | RECORD NUMBER | 1544 |
| SECTION 4/ 54 NOT IN DIRECTORY | | |
32. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 4, MT= 55 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=6337, MF= 4, MT= 55 | RECORD NUMBER | 1621 |
| SECTION 4/ 55 NOT IN DIRECTORY | | |
33. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 4, MT= 56 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=6337, MF= 4, MT= 56 | RECORD NUMBER | 1694 |
| SECTION 4/ 56 NOT IN DIRECTORY | | |
34. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 4, MT= 57 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=6337, MF= 4, MT= 57 | RECORD NUMBER | 1765 |
| SECTION 4/ 57 NOT IN DIRECTORY | | |
35. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 4, MT= 91 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=6337, MF= 4, MT= 91 | RECORD NUMBER | 1834 |
| SECTION 4/ 91 NOT IN DIRECTORY | | |
36. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 5, MT= 16 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=6337, MF= 5, MT= 16 | RECORD NUMBER | 1904 |
| SECTION 5/ 16 NOT IN DIRECTORY | | |
37. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 5, MT= 17 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=6337, MF= 5, MT= 17 | RECORD NUMBER | 2014 |
| SECTION 5/ 17 NOT IN DIRECTORY | | |
38. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 5, MT= 22 (0): Directory (b)
- | | | |
|---|---------------|------|
| ERROR(S) FOUND IN MAT=6337, MF= 5, MT= 22 | RECORD NUMBER | 2064 |
| SECTION 5/ 22 NOT IN DIRECTORY | | |
39. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 5, MT= 28 (0): Directory (b)

ERROR(S) FOUND IN MAT=6337, MF= 5, MT= 28
SECTION 5/ 28 NOT IN DIRECTORY RECORD NUMBER 2137

40. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF= 5, MT= 91 (0): Directory (b)

ERROR(S) FOUND IN MAT=6337, MF= 5, MT= 91
SECTION 5/ 91 NOT IN DIRECTORY RECORD NUMBER 2220

41. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF=33, MT= 2 (0): Directory (b)

ERROR(S) FOUND IN MAT=6337, MF=33, MT= 2
SECTION 33/ 2 NOT IN DIRECTORY RECORD NUMBER 2469

42. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF=33, MT= 4 (0): Directory (b)

ERROR(S) FOUND IN MAT=6337, MF=33, MT= 4
SECTION 33/ 4 NOT IN DIRECTORY RECORD NUMBER 2559

43. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF=33, MT= 16 (0): Directory (b)

ERROR(S) FOUND IN MAT=6337, MF=33, MT= 16
SECTION 33/ 16 NOT IN DIRECTORY RECORD NUMBER 2622

44. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=6337, MF=33, MT=102 (0): Directory (b)

ERROR(S) FOUND IN MAT=6337, MF=33, MT=102
SECTION 33/102 NOT IN DIRECTORY RECORD NUMBER 2634

- **linear** Errors:

1. Negative cross section found
0: Neg. Sig(E)

```
Linearize ENDF/B Cross Sections (LINEAR 2015-1)
-----
Retrieval Criteria----- MAT
Monitor Mode----- Off
Minimum Cross Section----- 1.0000E-10 (Default Option)
... [61 more lines]
```

- **fudge-4.0** Warnings:

1. Missing a channel with a particular angular momenta combination
resonances / resolved / MultiLevelBreitWigner (Error # 0): missingResonanceChannel

WARNING: Missing a channel with angular momenta combination L = 0, J = 1.0 and S = 1.0 for "capture"

2. Potential scattering hasn't converted, you need more L's!
resonances / resolved (Error # 1): potentialScatteringNotConverged

WARNING: Potential scattering hasn't converged by L=0 at E=29.7 eV, xs[0]/xs[0]=100.0% > 0.1%

3. The URR for this spin group needs higher energy resolution for correct representation of the average cross section
resonances / unresolved (Error # 0): URRinsufficientEnergyGrid

WARNING: More points needed in L=0 J=2.0 unresolved widths between 29.7 eV and 1.e2 eV

WARNING: More points needed in L=0 J=3.0 unresolved widths between 29.7 eV and 1.e2 eV

WARNING: More points needed in L=1 J=1.0 unresolved widths between 29.7 eV and 1.e2 eV

WARNING: More points needed in L=1 J=2.0 unresolved widths between 29.7 eV and 1.e2 eV

... plus 8 more instances of this message

4. Cross section does not match sum of linked reaction cross sections
crossSectionSum label 0: total (Error # 0): CS Sum.

WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.43%

5. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 0 (n + Eu155): / Form 'eval': / Component 0 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

6. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 0 (n + Eu155): / Form 'eval': / Component 1 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

7. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 1 ((z,n)): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

8. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 2 (n[multiplicity:'2'] + Eu154): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

9. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 3 (Eu156 + gamma): / Form 'eval': / Component 0 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

10. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 3 (Eu156 + gamma): / Form 'eval': / Component 1 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

- fudge-4.0 Errors:

1. Calculated and tabulated Q values disagree.
reaction label 9: n[multiplicity:'2'] + Eu154 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -10059897.46237183 eV vs -8.1522e6 eV!

2. Calculated and tabulated Q values disagree.
reaction label 10: n[multiplicity:'3'] + Eu153 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -16502126.81604004 eV vs -1.4593e7 eV!

3. Calculated and tabulated Q values disagree.
reaction label 11: n + H1 + Sm154 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -8560333.941223145 eV vs -6.6527e6 eV!

4. Calculated and tabulated Q values disagree.
reaction label 12: Eu156 + gamma (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 4431187.27331543 eV vs 6.3386e6 eV!

5. Calculated and tabulated Q values disagree.
reaction label 13: n + He4 + Pm151 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -2762642.410766602 eV vs -856250. eV!

6. Calculated and tabulated Q values disagree.
reaction label 14: H1 + Sm155_s (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -2753374.212677002 eV vs -845910. eV!

7. Calculated and tabulated Q values disagree.
reaction label 15: H2 + Sm154_s (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -6335767.840301514 eV vs -4.4281e6 eV!

8. Calculated and tabulated Q values disagree.
reaction label 16: H3 + Sm153_s (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -8045602.309875488 eV vs -6.1388e6 eV!

9. Calculated and tabulated Q values disagree.
reaction label 17: He4 + Pm152_s (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 3175719.45703125 eV vs 5.0874e6 eV!

- njoy2012 Warnings:

1. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
group...compute self-shielded group-averaged cross-sections (0): GROUPE/conver (0)

---message from conver---cannot do complete particle production for mt= 16
only mf4/mf5 provided

2. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
group...compute self-shielded group-averaged cross-sections (1): GROUPR/conver (0)

---message from conver---cannot do complete particle production for mt= 17
only mf4/mf5 provided

3. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
group...compute self-shielded group-averaged cross-sections (2): GROUPR/conver (0)

---message from conver---cannot do complete particle production for mt= 22
only mf4/mf5 provided

4. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
group...compute self-shielded group-averaged cross-sections (3): GROUPR/conver (0)

---message from conver---cannot do complete particle production for mt= 28
only mf4/mf5 provided

5. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
group...compute self-shielded group-averaged cross-sections (4): GROUPR/conver (0)

---message from conver---cannot do complete particle production for mt= 91
only mf4/mf5 provided